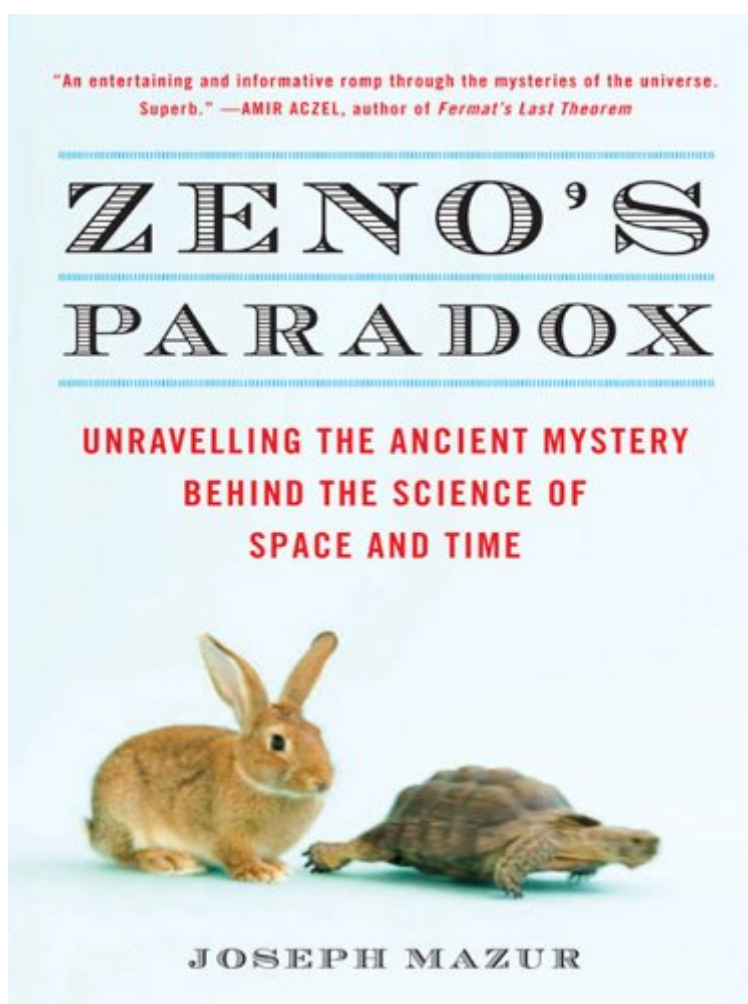


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# Zeno's Paradox: Unraveling The Ancient Mystery Behind The Science Of Space And Time



## Synopsis

The fascinating story of an ancient riddle—and what it reveals about the nature of time and space. Three millennia ago, the Greek philosopher Zeno constructed a series of logical paradoxes to prove that motion is impossible. Today, these paradoxes remain on the cutting edge of our investigations into the fabric of space and time. Zeno's Paradox uses the motion paradox as a jumping-off point for an exploration of the twenty-five-hundred-year quest to uncover the true nature of the universe. From Galileo to Einstein to Stephen Hawking, some of the greatest minds in history have tackled the problem and made spectacular breakthroughs—but through it all, the paradox of motion remains.

## Book Information

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## Customer Reviews

Zeno's Paradox tends to be told from the perspective of the tortoise and the hare. The question is posed with the hare starting behind the tortoise at  $t=0$ , each time the hare runs the distance between the two, the tortoise would have moved forward by an amount equal to its slower speed multiplied by the time. As this process goes in ad infinitum question becomes how can the hare overtake the tortoise despite the hare being faster? Asked another way, how can an infinite number of steps be finite. Zeno's paradox has a long history of analysis and the formal answer to the initial

question was resolved several millenium later when it was realized that an infinite sum might still be a finite number. Joseph Mazur explores the topic yet again by questioning whether calculus based answers tell us what is happening in the physical world. It is an interesting book and does a good job describing mathematical history of analysis and the evolution of many ideas in physics. It is not really about zeno's paradox throughout and some parts are quite long winded but definitely it does a unique job of using an ancient question about the nature of reality and re-apply the logic to our understanding of the physical world today. The book is split into 4 parts. The first sets the stage with ancient greece and describes zeno's paradoxs, which are several and discusses how the ancient greeks approached and debated the problems. The second part explores pre-calculus Renaissance and how the nature of physical reality and motion starts to be explored more rigorously with Galileo and Kepler. The third section describes the evolution of the math. Analytic geometry is discussed and the stage is set for Newton and Leibniz and the world enters the Enlightenment.

and perhaps the book won't overtake you and you won't have to buy it. I purchased this product some time ago, but didn't feel up to the task of reviewing it. What for? Who heeds bad revs? It's a bad (or rather, unworthy of its theme), bad book all right. I'll be brief: 1) Its exposure of philosophy is superficial and biased (I don't have the space here to give examples, but trust me). 2) It's repetitive. For example, the stadium paradox is covered at least thrice: in page 4 of the Introduction (where it's stated that Aristotle exposed it as based on a fallacy); in pp. 29/31, where Mazur gives Zeno his due; and in page 41/42, where the book says Aristotle failed to understand the nature of the paradox. The other paradoxes (especially the arrow) are also analyzed several times. 3) It's incoherently written. For example, in page 132, Mazur writes "The arrow paradox also requires an understanding of limits as a mathematical model for instantaneous velocity, which calculus treats as a derivative, an instrument that creates limits of average changes in a dependent variety in small intervals on an independent variable. The model here is to view each point on the arrow's trajectory as though it were a limit of a sequence of rational numbers on the number line, so the arrow's path is assured a persistent even flow of space in the continuity of time. In effect it assumes, quite correctly, that all numbers on the number line are convergent sequences of rational numbers". Half a page (in the book's oversize font) completely wasted. And don't you think that a reader who understands what "convergent sequences of rational numbers" means would also know what is a real number?

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